

WHAT IS CLAIMED IS:

1. An organic EL panel comprised of a plurality of pixels, each of the plurality of pixels comprising an organic layer disposed between a lower electrode and an upper electrode,

wherein the plurality of pixels repair themselves when a backward bias voltage equal to or less than a withstand voltage of the organic layer in a voltage application condition at a time of use is applied thereto.

2. The organic EL panel of claim 1, wherein the organic layer includes a light-emitting layer disposed between the lower electrode and the upper electrode.

3. The organic EL panel of claim 1, further comprising a resin protective film comprising a resin disposed on the upper electrode to cover the plurality of pixels, the resin protective film including oxygen as a constituent element,

whereby the resin protective film decomposes and releases a low molecular weight substance including oxygen when the lower and upper electrode short-circuit and when the backward bias voltage equal to or less than the withstand voltage of the organic layer in the voltage application condition at the time of use is applied.

4. The organic EL panel of claim 3, wherein the upper electrode and the organic layer are successively laminated on the lower electrode.

5. The organic EL display device of claim 3, wherein the resin protective film comprises a silicon resin.

6. The organic EL display device of claim 3, wherein the resin protective film comprises a fluororesin.

7. The organic EL display device of claim 3, further comprising an inorganic protective film comprised of inorganic matter, wherein the inorganic protective film is intervened between the resin protective film and the upper electrode, is formed by atomic layer epitaxy and the film thickness thereof is 200 nm or less.

8. The organic EL display device of claim 3, further comprising a gas-trapping getter inserted between the upper electrode and the resin protective film.

9. The organic EL display device of claim 3, further comprising a laminate film comprising metal foil or a laminate sheet formed by adhering together a metal film and resin films disposed on the resin protective film, wherein the laminate film is for shielding the plurality of pixels and the resin protective film from outside air.

10. The organic EL display device of claim 3, wherein the resin protective film comprises a desiccant mixed therein.

11. The organic EL panel of claim 1, wherein the withstand voltage of the organic layer is determined when the organic EL panel is driven for 1 minute or less in the voltage application condition at the time of use.

12. The organic EL panel of claim 1, wherein the backward bias voltage is $1/2$ of, or less than $1/2$ of, the withstand voltage of the organic layer.

13. The organic EL panel of claim 1, wherein an electric field intensity of the organic layer is 3×10^6 V/cm or greater when the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer.

14. The organic EL panel of claim 1, wherein an electric field intensity of the organic layer is 3.4×10^6 V/cm or greater excluding a conductive organic film from the organic layer when the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer.

15. The organic EL panel of claim 1, wherein when the backward bias voltage is represented as V_r , the thickness of the upper electrodes is represented as D_a , and the ratio V_r/D_a between V_r and D_a is represented as X_a , X_a is 2.2×10^6 V/cm or greater.

16. The organic EL panel of claim 15, wherein X_a is 2.2×10^6 V/cm or greater as a result of the thickness D_a of the upper electrodes being thinned to 100 nm or less.

17. The organic EL display device of claim 15, wherein the thickness D_a of the upper electrodes is thinned to 100 nm or less, whereby X_a is 2.2×10^6 V/cm or greater.

18. The organic EL panel of claim 1, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer is represented as D_y , and the ratio V_r/D_y between V_r and D_y is represented as Y_a , Y_a is 1.2×10^6 V/cm or greater and 2.2×10^6 V/cm or less.

19. The organic EL panel of claim 1, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer excluding a conductive organic film is represented as $D_{y'}$, and the ratio $V_r/D_{y'}$ between V_r and $D_{y'}$ is represented as $Y_{a'}$, $Y_{a'}$ is 1.4×10^6 V/cm or greater and 2.4×10^6 V/cm or less.

20. The organic EL panel of claim 1, wherein the plurality of pixels are sealed with a gas including a gas that increases susceptibility to burn at 0.5% or more.

21. The organic EL panel of claim 1, wherein an average surface roughness R_a is 2 nm or less as the surface roughness

of the lower electrode.

22. A method for repairing an organic EL panel comprised of a plurality of pixels, each of the plurality of pixels comprises an organic layer, a lower electrode and an upper electrode, wherein the organic layer includes a light-emitting layer disposed between the lower electrode and the upper electrode, the method comprising:

applying a backward bias voltage equal to or less than the withstand voltage of the organic layer in a voltage application condition at a time of use so that the pixels repair themselves.

23. The method of claim 22, wherein the withstand voltage when the organic EL panel is driven for 1 minute or less in the voltage application condition at the time of use is used as the withstand voltage of the organic layer.

24. The method of claim 22, wherein a voltage that is $1/2$ of, or less than $1/2$ of, the withstand voltage of the organic layer is used as the backward bias voltage.

25. The method of claim 22, an electric field intensity of the organic EL panel is 3×10^6 V/cm or greater when the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer.

26. The method of claims 22, wherein an electric field intensity of the organic EL panel is 3.4×10^6 V/cm or greater excluding a conductive organic film from the organic layer in a case when the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer.

27. The method of claim 22, wherein when the backward bias voltage is represented as V_r , the thickness of the upper electrodes is represented as D_a , and the ratio V_r/D_a between V_r and D_a is represented as X_a , X_a is 2.2×10^6 V/cm or greater.

28. The method of claim 27, wherein X_a is 2.2×10^6 V/cm or greater as a result of thinning the thickness D_a of the upper electrodes to 100 nm or less.

29. The method of claim 22, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer is represented as D_y , and the ratio V_r/D_y between V_r and D_y is represented as Y_a , Y_a is 1.2×10^6 V/cm or greater and 2.2×10^6 V/cm or less.

30. The method of claim 22, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer excluding a conductive organic film is represented as $D_{y'}$, and the ratio $V_r/D_{y'}$ between V_r and $D_{y'}$ is represented as $Y_{a'}$, $Y_{a'}$ is 1.4×10^6 V/cm or greater and 2.4×10^6 V/cm or

less.

31. The method of claim 22, wherein the applying of the backward bias voltage is conducted in a state where the pixels are sealed with a gas including a gas that increases susceptibility to burn at 0.5% or more.

32. The method of claim 31, wherein a panel is used where an average surface roughness Ra is 2 nm or less as the surface roughness of the lower electrodes.

33. The method of claim 22, wherein a panel is used where an average surface roughness Ra is 2 nm or less as the surface roughness of the lower electrodes.

34. An organic EL display device comprising:

a pixel that comprises a lower electrode, an organic layer including a light-emitting layer and an upper electrode successively laminated; and

a resin protective film comprising a resin disposed on the upper electrodes so as to cover the pixel, the resin protective film including oxygen as a constituent element, whereby the resin protective film decomposes and releases a low molecular weight substance including oxygen when the lower and upper electrodes short-circuit and when a backward bias voltage equal to or less than a withstand voltage of the organic layer in a voltage application condition at the time of use

is applied.

35. The organic EL display device of claim 34, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer is represented as D_y , and the ratio V_r/D_y between V_r and D_y is represented as Y_a , Y_a is 1.2×10^6 V/cm or greater and 2.2×10^6 V/cm or less.

36. The organic EL display device of claim 34, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer excluding a conductive organic film is represented as $D_{y'}$, and the ratio $V_r/D_{y'}$ between V_r and $D_{y'}$ is represented as $Y_{a'}$, $Y_{a'}$ is 1.4×10^6 V/cm or greater and 2.4×10^6 V/cm or less.